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IN THE UNITED STATES DISTRICT COURT
NORTHERN DISTRICT OF ILLINOIS
EASTERN DIVISION

THE MAGNAVOX COMPANY, et al.,

Plaintiff,

vs.

CHICAGO DYNAMIC INDUSTRIES
and SEEBURG CORP.,

Defendants

No. 74 C 1030
and

74 C 2510
FILED

MAR 2 - 1977

TRANSCRIPT OF PROCEEDINGS H. Stuart Cunningham, Clerk
United States District Court

had at the trial of the above-entitled cause before
the Honorable JOHN F. GRADY, one of the Judges of said
Court, in his courtroom in the United States Courthouse,
Chicago, Illinois on Thursday, November 4, 1976 commencing
at 10:00 a.m.

PRESENT:

MESSRS. NEUMAN, WILLIAMS, ANDERSON & OLSON
(Suite 2000, 77 West Washington Street
Chicago, Illinois 60602) by
MR. THEODORE W. ANDERSON
MR. JAMES T. WILLIAMS

and

MR. THOMAS A. BRIODY
(The Magnavox Company
1700 Magnavox Way
Fort Wayne, Indiana 46804)

appeared for The Magnavox Company;

MESSRS. THREEDY & THREEDY
(Suite 1406, 111 West Washington Street
Chicago, Illinois 60602) by
MR. EDWARD C. THREEDY

appeared for defendant Chicago Dynamic
Industries;

MESSRS. MC DOUGALL, HERSH & SCOTT
(Suite 1540, 135 South LaSalle Street
Chicago, Illinois 60603) by
MR. MELVIN M. GOLDENBERG and
MR. WILLIAM T. RIFKIN

appeared for defendant Seeburg Corp.

ALSO PRESENT:

MR. ROBERT LEVY

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THE COURT: Good morning, gentlemen.

MR. ANDERSON: Good morning, your Honor.

THE CLERK: 74 C 1030 and 74 C 3510, Magnavox
v Chicago Dynamics, for trial.

MR. GOLDENBERG: Ready, your Honor.

MR. ANDERSON: Plaintiffs are ready, your Honor.

THE COURT: Do you wish to make opening state-
ments?

MR. ANDERSON: Yes, the plaintiffs do, your Honor.

THE COURT: Mr. Anderson, will you proceed?

MR. ANDERSON: As threshold matters, the parties
have made an effort to stipulate to as many facts as pos-
sible and have had some success. At this time I will
hand up to the Court a document entitled "Agreed Statement
of Facts" which has been signed by all three of the par-
ties in the two remaining civil actions.

THE COURT: It might be a good idea if I read
that. Let's see how long it is.

MR. ANDERSON: It is a little lengthy.

THE COURT: All right, I will tell you then. I
assume that you will stay away from things that are stip-
ulated, and then I will read this during recesses.

MR. ANDERSON: I think that would be appropriate.
I think the stipulations often go to specifics that will
need testimony or exhibits to surround them.

4

THE COURT: I understand it is not a complete separation.

MR. ANDERSON: The parties had a difference on the relevance of some documents and evidence that the plaintiffs wish to put in relating to the development of the accused games, and we have prepared a separate document, entitled "Plaintiffs' Contentions of Facts Relating to Development of Accused Games".

We have served the other side, and I would like to file that at this time.

THE COURT: All right.

MR. ANDERSON: Each party has also exchanged a list of exhibits that they intend to offer in evidence. We do not have any specific documents indicating objections. I believe in general there will not be objections to most of these documents and exhibits by either party. I believe the defendants will object to our documents and exhibits relating to this development of the accused games.

THE COURT: Let me make this suggestion in that regard. I have had some success with this technique in avoiding a lot of unnecessary verbiage. Let's just assume that unless the contrary is stated, nobody has any objection to the foundation for a document insofar as its authenticity is concerned.

So it won't be necessary to have the witness say, "Is this a document made in the ordinary course of business," or anything of that kind. Just show him the document and refer to the exhibit number and have him testify about it.

We can even eliminate the stipulation on a particular document. Unless I hear an objection, I will assume that it comes in as far as authenticity is concerned, and then if there is any objection as to the relevancy or materiality, that would be another matter.

MR. ANDERSON: I think that is an appropriate procedure.

MR. GOLDENBERG: Your Honor, I think that is acceptable.

THE COURT: All right.

MR. ANDERSON: I will then hand to the Clerk a document entitled "Plaintiffs' Exhibits for their Prima Facia Case". This document has been served on the other side.

THE COURT: Thank you.

MR. ANDERSON: I believe the parties also have agreed orally to stipulate that xerographic and similar copies can be used for originals and that uncertified copies of Patent Office documents do come from the Patent Office records and also can be used in place of certified copies thereof.

MR. GOLDENBERG: That is correct.

THE COURT: Very well.

I have read plaintiff's trial brief, so I have some general familiarity with what the questions are.

MR. ANDERSON: I certainly will take that into account.

OPENING STATEMENT ON BEHALF OF PLAINTIFFS

BY MR. ANDERSON:

I would like to go over the points we think we will prove by the evidence. I will not touch on the law, which is completely in our trial brief, I believe.

As the court knows, this case relates to television games.

What the plaintiffs have provided, what they have given to the public, is the ability to play interactive games on ordinary TV screens. When we look

at what industry existed or what the plaintiffs were improving on in 1968, I think the record will clearly show there was no such industry as TV games or interactive games played on TV screens in 1968, the date when the inventive work was done by the plaintiff inventors.

Not only that, but as late as 1972, when the plaintiff Magnavox introduced its game Odyssey to the marketplace, I think the record will show that this was a new product, that there was no art as such for playing games on TV screens, and when we look at what has happened since then I think the record, the evidence we will put in, will show that an industry was created and the industry was created I think the evidence will show, on peradventure, as a result of these inventors and a group at Sanders, and the initial marketing efforts of Magnavox and the Odyssey game, which reached the marketplace in 1972.

The industry, I think the record will show -- and both parties I think would agree -- is now bifurcated into two industries:

One, the industry of games for attachment to broadcast television receivers in the homes of individual consumers, where they can play games in their homes; a second industry has grown out of the Sanders inventions, and I think the record will show exactly how

the second industry grew up, and that second industry is coin-operated games, in which a television receiver is used to play games, either with certain parts that are nonessential for the coin-operated version disabled or omitted from the game.

As one goes through the agreed facts, and even the contested facts, I think there is no real fact dispute as to the underlying events that occurred historically or the documents that exist or the facts as they really occurred.

I think the only disputes which will require a decision by the Court are inferences to be raised from the agreed facts and the facts about which I think there really is no dispute.

So I would like to briefly address the history of how the TV games we are fighting about here came into existence.

Ralph Baer in 1966 at Sanders Associates recognized a need for a use for TV sets other than sitting and watching them, and he set out to create such a use.

He had initially in mind, and the evidence will clearly show, an initial 1966 concept of a simple low-cost use of TV for other than just watching.

In 1967 the record will show he obtained management approval from Sanders Associates to pursue his endeavor, which he outlined in some documents, which will be introduced, and that endeavor was financed by Sanders Associates, and a group was created, including Mr. William Rush and Williah Harrison, and these three individuals and others pursued the development of TV

games at Sanders Associates for a period of over a year, and these three individuals are the individuals on one of the two patents in suit, and Mr. Rush is the inventor on the other patent in suit.

After much effort by this group, the record will show, the group came up with usable circuits and simple circuits that used the standard television signal format and television apparatus capable of handling that signal format in order to play games and to play games interactively with players and a game control movable hit spots being manipulated on the screen.

The record will show further, I think, that this group at Sanders Associates continued their work until they had perfected in 1968 such a simple, inexpensive circuit which could be used with the standard television equipment and the standard television signal format that includes three things:

Horizontal synchronization information;

Vertical synchronization information; and

Video information, the content of the thing you are seeing on the screen.

I think the record will show this group created timing circuits, unique circuitry to very simply and very inexpensively display a hit spot and hitting spot on a TV screen during 1968, whereby a player could

manipulate the hitting spots and cause them to intercept a game movable, freely-moving hit spot, and cause it to change direction, and the player could manipulate his hitting spots to intercept the hit spot.

The hit spot is frequently called the ball and the puck in both the patents and the industry as it developed. The hitting spots in the appropriate cases may be called a paddle or racquet, a stick or the like.

As a result of this effort in the period 1967 and 1968, several patents were issued and two of those patents are the two patents in suit here.

The two patents that initially issued were U.S. Patents 3,659,284 and 3,659,285. They issued on the same day, April 25, 1972.

Later, as a result of negotiations and facts that came to light, the plaintiffs elected to seek reissue of those two patents and the two patents were reissued as reissue patents 28,507, which is the reissue of the '284 patent, and 28,598, which is the reissue of the '285 patent.

I think there is no dispute that the reissue patents for all purposes replaced the original patents and had the same effect as the original patent, as to what was in the original patent.

If there are new claims or anything new in the reissue patents, then a different situation will govern, and that is covered in our brief.

The reissue patents do face certain questions of intervening rights and an effective date that is later than the original filing date for certain purposes.

The plaintiffs have identified the two original patents and the two reissue patents as Plaintiffs' Exhibits 1-A through 1-D, which are the first four

exhibits on our exhibit list, and they are bound in a notebook, which I will hand up, and upon completion of the statement I will offer it at our first exhibits in the case.

I believe to understand these patents, to understand even the initial testimony, which will be Mr. Ralph Baer -- to understand best the positions of the parties, it is necessary to have at least some understanding of how the television picture is formed on a television screen.

For that purpose our technical expert has prepared a chart, which I have on the easel, which is Plaintiffs' Exhibit 79, and it is intended as a rudimentary expression of just how a TV picture is generated.

Seeing Mr. Baer will precede Mr. Ribbens, I would like to spend just a few seconds, if I may, on an explanation of how the TV format is generated.

The TV format is generated in the form of lines on the screen. The number of lines depends on the particular system. 525 lines is the U.S. standard, and that means that the screen is broken up into 525 horizontal lines. I think most of the TV games use a few less, perhaps 512, or some number in that general order, primarily because those are easier numbers to work with in some cases.

In some of the European systems the number runs higher, perhaps 600 lines or over.

But the picture is broken down into lines, because there is no technique for passing through a wire in the various amplifiers of the circuit the entire picture at one time.

Therefore, many years ago the solution was found to break up the picture into something that could be passed through a wire and through video amplifiers and reconstituted on a screen. I have attempted, or Dr. Ribbens, has attempted to illustrate how that is done with this chart, Plaintiffs' Exhibit 79. We have tried to represent in just eight lines a complete television format and, therefore, we had to keep the picture very simple.

On Exhibit 79 it is supposed to represent a man. In order to send that picture of the man, represented on the white screen, through a wire, it is like trying to pass the picture through a hole where you can't roll it all up and put it through.

You break the picture up into lines, and we have cut this white field at the top of Exhibit 79 into eight strips. So it can be seen that if one starts to just transmit information about the picture in the form of lines, starting from left to right, he first takes what is represented by the top strip, which in this case is all white, and he sends a signal, which would be a constant signal with zero information on it, except the white information.

He transmits that through the wire to the picture. The television receiver has what is called hori-

zontal and vertical scanning, so that while this information is being sent, representing the top line, the horizontal sweep is making a top line across the television picture screen. It would make a white line across the top of the screen, as the white information represented by the top strip from Exhibit 79 is passed through a wire.

When you get to the end of that first line of information, the television format includes a horizontal synchronization signal, called a sync signal. When the television receiver receives that horizontal sync information, marked in red at the right edge of the top strip of Exhibit 79, the receiver knows it is time to start displaying the next line.

The receiver scans back to the left edge of the picture tube, so that now the information that is coming in represents the second line and the television set is prepared to receive a second line.

So I will now peel the second strip off of the picture at the top of Exhibit 79, representing the second bit of information sliced out of the original picture, passed along, following the horizontal pulse, indicating "Start the next line".

That now includes still zero information, until you get to the head of the man, which is black. That would be information saying "Black" for a period of

time, and after the end of that time, the video information goes back to saying "Make the screen white".

That continues for a period of time until you get the next horizontal synchronization pulse. This tells the television screen again to go back to the left side, and it continues to do that and it makes the third strip.

That third strip is transmitted until the third horizontal pulse is received.

This is information taken from a camera that is doing exactly the same thing, or a circuit, in the case of a game, that is doing exactly the same thing and generating information representing the picture from left to right, one line at a time.

It is just like feeding this through a hole. The information comes through first the very left edge, and then as you push it through, you see what is coming through and you say, "It is all white in the first line," and then as the next line comes through, you say "I am now painting the second line and it is white," and then becomes black and then becomes white. You reconstruct it as the picture comes over this wire, which is the analogy of this hole in the wall.

So the camera or the game equipment continues to perform that kind of operation, generating the fourth line, then another horizontal synchronization pulse, and the fifth line, and another horizontal synchronization pulse, and the sixth line, and another horizontal pulse, and the seventh line, and another horizontal sync pulse, and finally the eighth line, which in our graphic demonstration is the last line. This would be the 500th line in a real television picture.

At that point in time the signal format that is coming through the wire includes a vertical signal. It says, "You have now completed the vertical scan down the picture tube," and the transmitter has now completed the vertical picture. That information tells the television set, "Go back to the upper left-hand corner." The whole process starts over.

By that time the scene has changed, perhaps, and you generate a different picture. If the scene has not changed, the picture would be identical and would repeat exactly what was shown by the original picture of the man on the screen.

THE COURT: Will you repeat what you just said? What happens when you get down to the end? I was writing and I missed the first part of that.

MR. ANDERSON: Certainly. At the end of the last

line -- in this case the eighth line -- there is not only horizontal information to tell the receiver to go back to the left edge of the screen, there is also vertical information which says, "Go back to the top of the screen."

So the electronics, the horizontal sweep circuit, makes the television set go back to the left edge. The vertical sweep circuit makes the picture painting beam of electrons or light go to the top. When you combine these two, of course, it means that in essence the electron beam, which is creating this picture, sweeps diagonally from the lower right-hand corner to the upper left-hand corner in response to the blue and the red pulses simultaneously. These both happen at the same time. The beam is up here, and it starts painting the top strip of the picture again, from left to right.

So by that technique it is possible to break a very complex picture or a simple one, such as we have drawn here, into individual elements which can be transmitted through a wire and processed in the television circuitry. In the circuitry, coming in at an input, are the horizontal pulses, the vertical pulse information, and the picture information, altogether, all on one wire.

There is a circuit in the television equipment that separates those three into three separate channels:

one, vertical information, which tells the vertical oscillator, "Go back back to the top"; another channel comes out of the sync separator, and it is called the horizontal information, and it tells the electron beam of the picture tube, "Go back to the left."

So when those happen, you start a new picture, and then the third channel passes through what are called video amplifiers and paints the picture on the screen as it sweeps down the entire field a second time and a third time.

Now, that is normally repeated approximately sixty times a second in television format, with 262 lines, repeated in a manner that is called interlacing, to create a complete picture a 30th of a second. Thirty times a second in a television format, you reproduce 525 lines.

Of course, as long as it is 30 times a second, there is no sense of a flickering that might be present if this were done less often. So that 30 times a second, to refresh the whole field, is considered to be a standard and an optimum in the U.S. television practice.

With that technique, it is possible to display on this picture complex forms. We have only shown white and black, so there are only two signals required, plus and minus or one and zero or on and off. In the television format, of course, they can transmit grays, and then in a separate set of circuits, that I won't get into, they separately transmit color or chrome information. That also can be utilized in playing games, or it can be utilized in generating pictures from a television studio.

But the rudiments of a TV signal format, a standard TV format, are the horizontal sync signals, the vertical sync signals, and the video information, which in this case is just black or white, on or off, video information that turns this little, like a flashlight on and off as it scans from left to right on the whole field and then starts over at the upper left-hand corner and does the same thing again and again and again to give a picture.

As the signal changes, as the time between the horizontal pulse and the beginning of the black, as that time changes, then, of course, the black would appear to move left to right because the timing between the horizontal pulse and the beginning of the black determines where on the screen the black will appear. If the

black were right after the horizontal pulse, it would be way over here. On the other hand, if the black were just before the horizontal pulse, it would shift over to the right and be at the far right edge of the screen and not the far left, as I showed in the first case.

So the simple diagram here of how a TV format generates a TV picture shows how pictures can be generated and also how they can move around on the screen, I think.

I think after the Court has heard Mr. Baer's testimony, you may have questions about this, and Dr. Ribbens then will be here later to go through this and explain how it is actually done in both the standard television format, as well as how it is done in the circuits that make a television picture and the circuits that make a game picture, in both the patented products and in the accused product.

The patents in suit take advantage of this strip effect that I have just demonstrated in Plaintiffs' Exhibit 79 to generate pulses and control the position of spots on a television screen and provide means under player control to move those spots from left to right and up and down and to try to intercept another spot, called a ball, which moves freely, not under the direct control of a player normally.

If the player, by manipulating his hitting spot in the first patent, the '507 patent, is successful in intercepting the hit spot, which is freely moving across the screen, then because of the timing that I have described with respect to Plaintiffs' Exhibit 79, there is a phenomenon called coincidence in the game circuits, which causes the ball to reverse or changes its direction and move off in a different direction.

This is accomplished by timing circuits in the game apparatus that we will go into in greater detail, but the essence, I believe, at least as I see the essence of the '507 patent, it involves the use of this synchronization information and timing information in order to enable players to move hitting spots and intercept hitting spots and cause those hit spots to change their direction of travel in some way.

Now, the second patent, the '598 patent, relates to a somewhat different, and in many respects, better circuit internally than the first circuit that was used in the '507 patent. The actual circuit used in the '507 patent was characterized by the inventors as a slicer circuit. It had certain advantages, but it also had certain drawbacks, one of which was the group at Sanders found they had difficulty making straight visible lines on the screen.

So the invention of '598 provided a means for generating fixed visible symbols on the screen in a manner in cooperation with the hitting and the hit symbols that I have already described, so that when the hit symbol, the ball or puck, would seem to hit or coincide with or intercept the visible fixed walls, the timing circuits would make the hit symbol change direction, based upon hitting the wall, and go off in a new direction.

Both patents teach specific circuit details for accomplishing these things, and we will go into those. The evidence will show how they functioned in detail with respect to the patents in suit.

After the work at Sanders was completed, the Sanders people sought to have what they thought was their revolutionary ideas and work see the commercial light of day. They began contacting people, primarily in the television industry, to seek licensees or manufacturers. After talking to many people, including RCA, Radio Corporation of America, for a long period of time, and having a license almost executed at RCA, they did enter into an agreement with Magnavox whereby Magnavox became the exclusive licensee, with the right to grant sublicenses under the patents resulting from this development effort at Sanders.

Magnavox took that license, I believe, in 1971, and introduced a product in the marketplace in April of 1972, that product, of course, called Odyssey. We will demonstrate Odyssey to the court and explain the Odyssey circuit, how it compares to the Sanders development circuit, in the course of the evidence.

Their purpose was to provide a simple game with a control box that cost under \$100, and they succeeded in doing this. It was introduced in the marketplace for the Christmas 1972 market season. It received a great deal of attention and interest in both the coin-operated field and in the home entertainment field.

One Nolan Bushnell of Atari, Inc., one of the former defendants in this litigation, attended one of the introductory meetings on Odyssey on May 24, 1972 at Burlingame, California, one of many introductory demonstrations and announcing sessions that Magnavox conducted during April and May of 1972.

Nolan Bushnell was attracted to the Odyssey, and the record will show that shortly thereafter, after he saw the Odyssey in May of 1972, he formed Atari, Inc., and by, I think, November had developed the game called Pong.

Now, the Pong operates on the same principles that I have described. It uses the horizontal

and vertical sync signals, and the record will show that it has hitting and hit symbols, which the hitting symbols are manipulated by the players and are called paddles, and the hit symbol is game controlled and is called a ball.

Mr. Bushnell did that under a contract with Midway Manufacturing Company, another former defendant in this case.

Midway then elected not to market Pong, and Mr. Bushnell did, on his own, through Atari, Inc.

That game was introduced to the coin market, as I said, around the end of 1972, and it also attracted very substantial immediate attention, so that many of the competitors in the coin-operated field immediately took steps to bring out a game competitive with Pong.

The fact is that most of the competitors copied Pong, and the record here will show that Seeburg, one of the defendants, bought a Pong game or acquired a Pong game and came to Magnavox, because Magnavox had know-how, and asked Magnavox to manufacture for Seeburg the game like Pong. Those negotiations went on for some time, and because of a difference over the number of games that should be made within a given time, no deal was made, and Seeburg, instead, came out with a copy of Pong, which they called Paddle Battle. I think our record here will show that Paddle Battle is down to the components identical to Pong, and, of course, Pong finds its direct genesis in the Odyssey game that Nolan Bushnell saw in May of 1972.

The story with respect to Chicago Dynamics Industries, the other defendant, is similar.

The record will show that they, too, did not design their own game, but they copied or substan-

tially copied, down to individual components, the Pong game that Atari initially introduced in the marketplace, and Chicago Dynamics called that game TV Ping Pong, and among the exhibits which we think are uncontested is Plaintiffs' Exhibit 35C, a photograph of the defendant CDI's TV Ping Pong game, Plaintiffs' Exhibit 35C.

This was produced by Gerry Koci, an officer of Chicago Dynamics, during the testimony of Chicago Dynamics and will be in evidence.

That game, TV Ping Pong, and also Paddle Battle, did not include any fixed visible borders or lines or walls. It was, like the '507 patent, free of any fixed visible walls and relied upon paddles intercepting balls to make them move around the screen.

Shortly after TV Ping Pong and Pong and Seeburg's Paddle Battle were introduced, Atari came out with a game that did include fixed walls, and the rest of the industry did, too.

I might say Odyssey had both options. You could play Odyssey in many different ways, but one was to simulate ping pong, in which there were no edges or walls visible, and another to simulate, for example, handball, where there was a wall, a visible wall, that caused the ball to bounce.

So both defendants here, Chicago Dynamics and Seeburg, shortly after introducing their first TV game, introduced a second, or another, game, which Seeburg called Pro Tennis, and the Chicago Dynamics game, called TV Tennis, which is also an accused game here. Both of those games, as shown typically in Plaintiffs' Exhibit 36-B, included lines, visible lines across the top and the bottom of the screen, off of which the ball would bounce if it intersected those lines, and in that way, in that sense, and in every real sense, it used the teaching of the '598 patent, we believe --- and I believe the evidence will show that.

So with that introduction of just a few of the games, a few of the points in the two patents in suit, plaintiffs believe that they can show both literal infringement and will put into evidence what I believe will show both literal infringement as well as infringement in fact. In other words, it will show infringement whereby the same means is used in the same manner to produce the same result -- a well-known U.S. Supreme Court test of infringement.

The elements, the way in which they function, we think, can be shown to be the same in the accused product, in the work that Sanders did, in the Odyssey and in the two patents in suit.

Now, I would just address myself very momentarily to the issue of validity. We of course, as plaintiffs, have the burden of proving infringement. We accept that burden. That burden is merely to show infringement by a preponderance of the evidence.

On the other hand, the defendants bear the burden of proving invalidity, and under the statute the patents are presumed valid, and the tests which the defendants must bear vary somewhat. It is at a minimum, by clear and convincing evidence in every jurisdiction in the country, and we believe that in the Seventh Circuit it is much heavier than that, approaching "beyond a reasonable doubt", a criminal test, and we will rely on the cases in that regard.

We understand from the defendants' pretrial memorandum, from the proofs that they have identified, that they will contend the patents are invalid, based primarily on three sets of circumstances or prior art.

First, on the ground that general purpose computers had been programmable and programmed to demonstrate the playing of certain games prior to the invention dates by the people at Sanders.

We say and we believe that the evidence will show that those people, instead of recognizing the importance of synchronization signals and timing to make

simple products that could be used with TV sets and TV equipment that was readily available, really taught away from the invention completely.

They failed, we think we can show, totally, to recognize the value of a simple television set in making games at a price and with the capabilities and simplicities that made a marketable product, and we think those are set forth in the claims clearly and therefore that defense must fail.

A second defense which we understand the defendants will put forward is that these two patents, the '507 patent and the '598 patent, should be held invalid because of the '480 patent, which was taken out by Sanders also, and they will contend either that the patent itself is prior art, which I think must fail, and the record will show must fail, or by the work which resulted in the '480 patent invalidates the patent.

We believe the record will show and the evidence will show and Professor Kayton will testify in certain respects, but even more importantly, the evidence, the documentary evidence, will show that the Patent Office, the examiner that was responsible for issuing the two patents in suit, was aware of the application that resulted in the '480 patent. It was cited by the Patent Office. It was identified as related subject matter by the Patent Office. Therefore, the presumption of validity bears heavily against the defendants when they attempt to prove invalidity based on the '480 patent.

Finally, apparently the defendants will assert certain work by Kaiser Aerospace as prior art.

There has been very little development of that theory of the case by the defendants. We have studied the patents upon which they rely, and they do not appear to include the elements that I have been discussing, the '507 and the '598 patents, and therefore we believe that we will be able to show that they cannot be considered either anticipatory or rendering the patents obvious.

I think the evidence will show that the examiner had the best prior art before him and that these are pioneer patents, creating an industry, and they de-

serve broad recognition by the Court and by the industry.

Your Honor, that completes my opening statement.

THE COURT: Thank you. Mr. Goldenberg?

OPENING STATEMENT ON BEHALF
OF DEFENDANT SEEBURG CORP.

BY MR. GOLDBERG:

Your Honor, I would like to hand to the Court our pretrial memorandum. I have supplied two copies in the event the Court can use them.

Mr. Anderson has handed the Court his document entitled "Plaintiffs' Contention of Fact Relating to Development of the Accused Games," and indeed much of his argument made reference to copying and that sort of thing.

I do tell the Court now that the reason the Court is receiving the document in this form is that in our meetings where we attempted to stipulate to the extent that we could, we took the position that that kind of argument, that kind of contention, has nothing to do with any issue that the Court has to face.

The issue before the Court, the issues before the Court, at this time are whether these patents are valid, whether or not they are infringed.

The Pong game is not in front of the Court.

The significance of copying, if there was copying, is on one point: A patent infringer who copies cannot contest to the utility of the patent in question.

We stipulate that the utility requirement of the patent statute has been satisfied. The issue before the Court are these games made and sold by these defendants, not Pong, or whatever that game was, or whatever Mr. Bushnell did, and to permit that kind of matter to come in is going to prolong and delay this thing, and the relevancy is clearly not there, the materiality is not there, and even though this be a trial before a judge, we do suggest that the element of prejudice is to be considered.

THE COURT: I take it from what Mr. Anderson says that their proof of infringement will in part take the form of showing that Pong was copied from them and you copied from Pong and therefore by means of a simple syllogism, your patent infringes theirs or your device infringes their patent.

What is wrong with that reasoning, forgetting whether it is factually so?

MR. GOLDENBERG: Well, your Honor, it introduces a chain of events which, first of all, is unnecessary.

Mr. Anderson has available to him circuit diagrams of the defendants' devices. He has available

to him, if I understand it correctly, experts who understand those circuit diagrams.

We have never stipulated that the defendants' games are the same as Pong, because they are not. There are differences there.

There is no evidence in this case, nor can there be, to our knowledge, that someone associated with Seeburg in the Seeburg organization sat down with a Pong game and copied it. That evidence is not there.

So that even if that chain of logic could theoretically exist, the facts are not going to permit it in this circumstance, and it is, as I have said, totally unnecessary when the real issue is do the defendants' games infringe, not does Pong infringe.

THE COURT: Well, I would just preliminarily, I think, agree with that, if there is no direct proof of copying, but rather merely circumstantial proof adduced by way of or suggested by way of similarity. Then it seems to me that that does not really add anything to what I otherwise would have in a case.

I am not ruling now, but I certainly do not want to spend any time here that I don't have to spend, and if it is the plaintiffs' intention to prove that as well as copying their device you also copied Pong, I don't think that solves it.

I doubt that will help you, but we will keep an open mind on it.

MR. GOLDBERG: I wanted the court to have that in mind at the outset, that the admissibility and spending the time on that issue, in our mind, is a very questionable exercise and does not at all get to the issue that the court must get to.

THE COURT: I will ask to hear Mr. Anderson further on this at the conclusion of the defense opening statement. Maybe we can get some guideline on that before we start the evidence.

MR. GOLDBERG: Thank you, your Honor.

As Mr. Anderson has stated, the burden is on plaintiffs to prove infringement, and to do that they

will have to prove to the court that defendants are doing the same thing or substantially the same thing that they are doing in substantially the same way to get substantially the same results.

We do not believe that there is any way that they can carry that burden.

Whether or not a patent is infringed depends on what I have just said. It depends on the claim language. The claim language very frequently in a patent is un-understandable. It can only gain understanding or meaning by reference to the description of the patent, the detailed description of the circuits.

Claims are a shorthand way of defining what the patent teaches the art.

Now, when that is done in this case, we believe the record will show that what this patent teaches the art is not utilized by these defendants. One can trace an ancestry, a lineage, if you will, of the defendants' circuits from the computer technology that Mr. Anderson says has nothing to do with it. It has much to do with it.

The defendants' circuits derive, using techniques and devices and processes, all of which in the mid-1960s surely had come to a high state of development in the computer art, and this is how the defendants'

games work. The plaintiffs' games do not work the same way. Their patents do not work the same way.

A very common phrase, and I should like to give just one example why this becomes particularly important in this case, in the patent claims that you will be considering, is, "Imparting a distinct motion to the hit spot."

Well, immediately the problem arises of what the phrase means.

If you look at the patent specification, the word "distinct" or "distinct motion" is not used at all. It simply is not defined. It appeared during the course of the patent prosecution -- I don't know whether to use the word spontaneously or mysteriously, but without any explanation. It appeared one day in a patent claim presented to the patent examiner after he had previously been rejecting claims. No definition was provided for that phrase, so we immediately have a problem with what are we dealing with here?

So we must resort to the specification to answer that as best we can, even though that term is not used.

When you do that, you will find that patents in suit talk about the motion of the ball after it hits a paddle or a man or a player, call it what you will, in

certain defined ways, certain very specific ways. Which one of those specific ways is the distinct motion the patent claim talks about we don't know, but let's say it covers any one or all of them.

Well, the fact is that the interaction between a ball and a paddle in any of the defendants' games is so totally different from that described in the patent, that this requirement that the device do substantially the same thing in substantially the same way to get substantially the same result cannot be met.

I would point out at this time that this language I have just used is the language of our Court of Appeals. It finds expression in the patent statute in Section 112, which permits a patentee to define his invention in terms of means plus a function performed by that means.

That is all right. But then the statute says that that means must be construed to cover the means shown in the patent or its equivalent. It cannot be construed to cover something which is not the equivalent of that shown in the patent, and that is in the statute.

We do not think that the plaintiffs will be able to carry their burden in that respect.

Now, on the matter of validity, which is our burden, as I said earlier, we think the record will show and satisfy the Court that the lineage, the ancestry, of the defendants' games is this computer technology.

In the mid-1960s, it was exploding all around us in every conceivable way. Starting much earlier than that, people working with computers found time on their hands, and for their own whimsical purposes or for some other purpose they began to play games, and a common device they had available to them was a cathode ray tube.

The television tube that Mr. Anderson described to the Court is a specific kind of cathode ray tube. A cathode ray tube is a device which is evacuated so as to be a substantial vacuum and, as Mr. Anderson described, an electronic beam moves back and forth across the screen and develops a picture.

The cathode ray tube -- I can't tell you now, but surely it was a common laboratory device starting in the 1930s at least, and perhaps earlier than that.

In any case, by the time we get to the period in which we are interested, this common laboratory device, the cathode ray tube, was in every laboratory in the country. Computer engineers had them available to them, computer designs, and they used them for their everyday work.

So, as I said, whether for whimsical reasons or for whatever reasons, they saw an opportunity, and they began to play games, using the cathode ray tube as the display device and the computer as the control, and they played pool games. They played maze games. They played all kinds of games.

This was a very common thing.

The first one we will tell you about was played in 1954 at the University of Michigan or a facility at the University of Michigan, where a pool game was

played, and there were bouncing balls and all kinds of things.

Now, the cathode ray tube used in that game and the kind of beam deflection system they had is not the same as Mr. Anderson described to you of what is called a raster scan pattern. It is a different kind of beam deflection system.

The principle, however, is the same. The only difference is how does the electron beam get to the spot where it wants to be to cause the screen to brighten and portray an image of some kind.

From 1950 on, as far as we know, people continued to play pool games and other games on computers with cathode ray tubes.

In 1967 the RCA laboratories held an open house. It was the 25th anniversary of the David Sarnoff Laboratories in Princeton, New Jersey. They had an invited guest list. They invited members of the public around Princeton, New Jersey. Eight thousand people came to this open house. They saw many demonstrations. Two of the demonstrations they saw involved playing games on computers with cathode ray tubes. One was a pool game. One was a maze game. The player could control what happened to the spots on the face of the tube.

Earlier than that students at universities played a game called Space War, and this was at particular universities -- the Massachusetts Institute of Technology and Stanford.

Again, the players could control, in conjunction with the computer, what happened to the spots.

What is the difference between all that and what has happened here? It is really very simple:

Goldenberg - opening

The decision to take all that had been done in conjunction with computers and cathode ray tubes, and to do it on the home television receiver.

Having made that decision certain things were dictated. Most importantly, the thing that was dictated was this raster scan display that Mr. Anderson described. There was no other display you could use.

If your purpose in life was to supply an attachment for home television receivers, and according to the plaintiffs' contention to the Patent Office over 60 million of them, and every one of those had a raster scan display, it would have been foolish to use any other kind of display.

So that was dictated. That could not have been an active invention. The circumstances compelled it. But even with that, that is not the intention of these patents.

Mr. Anderson told you about the patents in suit, and he made mention of a '480 patent. This patent, 3,728,480, also came out of the work of Sanders Associates. It is the work -- and we do not contend otherwise -- of Mr. Baer, who is one of the coinventors on the '598 reissue patent.

That was the first application they filed in the Patent Office. The law presumes that inventions are

made in the order in which applications are filed. That was the first one filed, it was not the first one issued. Perhaps we will be getting into that, but it was the first one filed.

That is the patent which says and which claims it is an invention to play games on home television receivers. That is not the invention of the patents in suit. They are far more specific than that.

What they have done, if they have done anything at all, is to take the alleged invention of the '480 patent and have added to it this well-known concept of playing bouncing ball games, balls bouncing, one symbol bouncing off of another symbol, one symbol bouncing off of a wall symbol, that the art well knew before those inventions were made, and that is what we must deal with.

The contention that the Patent Office considered the '480 patent we submit is wrong. It did not. It could not. There is no way the subject matter of the '480 patent could have been considered by the Patent Office.

When an application is presented to the Patent Office for examination, the only thing they can consider in treating that application is the prior art that is defined by the statute.

When the Patent Office was considering the patents in suit, the '480 patent was an application. It was not an issued patent. It could not have been considered as prior art, except for one thing, and that was never done; if the plaintiffs had gone to the Patent Office and said, "Look, the invention that we have in this application, which is later on going to become the '480 patent, was a prior invention and is prior art."

If they had told the Patent Office that, yes, the Patent Office could have considered it as prior art; but they never told the Patent Office that. The Patent Office did not know that, so it could not consider it.

So we do not believe it was considered, and --

THE COURT: It is not listed as a reference?

MR. GOLDENBERG: It is not listed as a reference.

The application for that patent is cross-referenced as an application in the patents in suit, but it is not listed as a reference and it could not have been because it never had issued.

That, sir, we think, is the defendants' case, and we trust you will find time to look at our memorandum for such value as that might have.

THE COURT: I certainly will.

Mr. Threedy?

OPENING STATEMENT ON BEHALF OF DEFENDANT,
CHICAGO DYNAMIC INDUSTRIES

BY MR. THREEDY:

Let me say, your Honor, that the defendant CDI wishes to join in with Mr. Goldberg's presentation of the atmosphere of the defendants' case, and I will direct my talk only to one issue which has been raised, the issue here of the matter of copying the Pong or Atari game.

CDI has admitted that it had the Atari game in its possession. It was not the first game that it had seen. It had seen the Nutting game first. It had looked at the Nutting game. It then got an Atari game.

CDI has been in the coin machine industry for some 45 years. They were not technically advanced to get into electronics, but they decided that it was time to because the evolution of games, coin-operated games, was coming into being as technology was catching up to the industry.

In order to learn this, they assigned two of their technicians to the Atari game to look at it, make a schematic from it. We admit that we did this.

The issue, though, that is before the Court is that if the plaintiff is going to contend that our circuit is identical, then all that is required of them is to prove the infringement of that circuit manufactured by this defendant. If not, they are going to have to be required to prove infringement of the circuitry of the Pong game, which is not in issue here and belongs to a party which is not a party to this lawsuit.

So it is a matter of how you want to present it and how it should be brought in. We believe, and I do believe and I join in with Mr. Goldenberg, that that matter is irrelevant. It is what this defendant did.

I think, as you indicated, you are going to give Mr. Anderson some time to address himself to that issue. That is the reason why I wanted to bring this factual matter to the Court's mind.

THE COURT: All right, thank you, Mr. Threedy.

Let me hear from you, Mr. Anderson, on what you believe to be the materiality of the Pong game.

MR. ANDERSON: Thank you, your Honor.

I might state first, I understand from

Mr. Williams that I misspoke and identified the Seeburg game as Paddle Battle, when in fact it is Paddle Ball. Paddle Battle is another accused game in this lawsuit sold by Seeburg, I believe, but manufactured by Allied Leisure Company of Hialeah, and it should have been Paddle Ball.

With respect to the point that has been raised by Mr. Threedy and by Mr. Goldenberg, I think that clearly, just from what has been said, there is relevance in the derivation, the manner in which the accused games came into existence.

First of all, the defendant often asserts just the contrary. He says "I developed the game independently and therefore it should be looked at in a different light and construed differently, especially if there are any differences."

I think the converse is equally true. If the defendant has derived his design from the plaintiffs' game or from the plaintiffs' patents -- or in this case, I would say both because we will show they are identical or substantially identical -- it is evidence of the unobviousness of the patent disclosures. It is evidence of infringement, and I think in this case, where Seeburg bought a Pong or acquired Pong, brought it to Magnavox, because Magnavox had the skill and the knowledge to build

a coin game -- they already had a home game on the market -- it is clearly relevant. It has some bearing, certainly, some relevance on the issues of infringement, and I think on validity, too.

Furthermore, as Mr. Threedy has indicated, CDI, in 30(b)(6) depositions, I believe, clearly admitted they bought a Pong and they made a circuit substantially identical to Pong. Under any concept of certainly copyright concept, access and similarity are evidence of the use of the Pong game or the thing to which they had access.

I think the identity of the circuitry in this case goes to that issue. It also goes to the issue of commercial success, I believe.

One might criticize our contentions that Odyssey and the Sanders inventions were great commercial successes. I think the fact that everything that we see here accused as infringement was begotten from Odyssey and the Sanders patents is clearly evidence of commercial success.

Again, defendants frequently argue the contrary, that there is no evidence of commercial success where they can show independent development or very substantial differences.

I think if the defendants say there are

differences, those will come to light in the course of the proofs.

Finally, I submit, your Honor, that we are not talking about any time consuming activity. The Koci deposition that Mr. Threedy mentioned is usable. It is 30(b)(6) deposition. The documentary evidence is easily understood and can be put into evidence. There will be very little required testimony on this particular point. It is primarily documentary.

It will come up, I am sure, in any event through commercial success and other points that are in issue.

THE COURT: Do the parties disagree on the substantial identity between the plaintiffs' devices and the Pong game?

MR. GOLDENBERG: Oh, yes, your Honor.

MR. THREEDY: Yes.

THE COURT: You do?

MR. GOLDENBERG: Oh, yes, your Honor. There is a very big issue there.

THE COURT: You see, I can anticipate a great deal of evidence on that score. You are going to say they are the same; they are going to say they are different. Therefore, for me to arrive at any conclusion as to whether the Pong game is significant, I am going to have to do two things: I am going to have to decide whether Pong is identical to the plaintiffs' patents, which will involve the battle of the experts on that, and then let's assume I decide that it is substantially identical. Then I am going to have the second battle of experts on whether the defendants' devices are substantially identical to Pong.

I really wonder whether that time is necessary for me to spend when the real issue is whether or not the defendants' devices are substantially similar to the plaintiffs' patents.

As far as commercial success is concerned,

I take it there is no issue on that. I heard Mr. Goldenberg say they don't contest utility. I don't think I have to sit here and listen to a lot of testimony about commercial success.

Certainly if the defendants don't deny that the plaintiffs' device has been commercially successful, it is not an issue here.

MR. GOLDENBERG: Your Honor, I think our position comes down to a relatively narrow point. We have already stipulated that the Magnavox Company has sold a substantial number of these games. That is in the stipulation in front of you.

THE COURT: Does that give the number that was sold or the approximate number?

MR. ANDERSON: Yes, your Honor, 800,000 games and 45 million dollars worth of product. There is no issue as to commercial success.

MR. GOLDENBERG: Except to this extent, your Honor, and I don't think it is going to take up a lot of the court's time: that whether or not the commercial success can be attributed to these patents.

I think you can understand why we raise that issue, that indeed the plaintiffs, Magnavox and Sanders, have other patents. We have made a particular reference to this '480 patent.

We will certainly be contending to your Honor that if there be commercial success, that can be attributed just as much, if not more, to this other patent, not to the patents in suit. That issue will stand.

THE COURT: To the '280 patent?

MR. GOLDENBERG: To the '480 patent.

THE COURT: '480 patent?

MR. GOLDENBERG: Right, your Honor, and only on that point, I think, would we be contending.

MR. ANDERSON: Your Honor, I understand from Mr. Goldenberg that they are arguing and will try to prove that their development somehow stems from these computer developments that they have talked about. We think we are entitled to try to rebut that.

One way that we can certainly rebut it is to show the genesis of their games, the same way that apparently they are going to try to show the genesis of their games.

THE COURT: Why don't we save Pong for rebuttal then? Let's wait and see how things go, and save it for rebuttal.

If there were an issue of intent here, I would be more persuaded that this is a question of your case in chief, but as I understand the law in these patent cases, you can infringe without the slightest knowledge

of the plaintiffs' patents, and you are guilty.

MR. ANDERSON: Yes, your Honor, that is true. I think we all agree.

MR. GOLDENBERG: Yes, your Honor.

THE COURT: What was going on in the defendants' minds as far as the Pong game is concerned seems to me to be immaterial. They either have devices which infringe your patents, or they don't. If they thought they did and in fact they don't, they are not guilty.

I won't say Pong is immaterial because I just don't know, but let's save it for rebuttal.

MR. ANDERSON: Your Honor, that raises only one mechanical problem for me. Our second witness is Mr. Robert Fritsche, a former employee of Magnavox, who was directly involved in this Seeburg negotiation between Magnavox and Seeburg.

I had planned, if necessary, to interrupt, if the Court will grant me leave, tomorrow morning to put him on. He is leaving for Brussels on Monday morning and will be gone for a period of time.

It would be quite short. His whole testimony, I don't think, will last a half a day.

MR. GOLDENBERG: Your Honor, I am trying to think of a way to accommodate Mr. Anderson on his problem, in view of the Court's present thinking about this matter.

It could be that that could go in as an offer of proof and the Court take it on that basis. Alternatively we could stipulate it is an offer of proof.

THE COURT: Was his deposition taken?

MR. ANDERSON: No, your Honor, it has not been.

MR. GOLDENBERG: I believe if the Court finds it admissible and relevant, I think we are willing to stipulate that there was a time when Seeburg took a Pong game to Magnavox and said "Can you make this?"

THE COURT: Is this gentleman a resident of this area?

MR. ANDERSON: Yes, your Honor, he lives in Buffalo Grove. He is presently an employee of Gentrys Foods.

THE COURT: How long is he going to be in Belgium?

MR. ANDERSON: I am not certain; about a week, I think.

THE COURT: He will probably be back by rebuttal time.

MR. ANDERSON: By rebuttal time, I am afraid he will be, yes, sir.

THE COURT: I assume I am not being unduly pessimistic when I say that.

I think we can let him go, and if it does become important -- very often, as we all know, things that seem to be of great importance on the opening day of a trial tend to become either less or more so as things fall into place.

So let's just hold that one in abeyance and let him go to Brussels.

MR. ANDERSON: I would still like, if I may, to have him testify tomorrow on other aspects of the litigation.

THE COURT: There is a possible problem tomorrow. I thought we would start here earlier than we did. I

had that jury trial that took longer than I anticipated.

I have scheduled another case for tomorrow, where the parties are bringing witnesses in from out of town. I think that is a half day case. At least I hope it is.

Then there is something that I had forgotten about myself. I have a sentencing seminar, having to do with the new Parole Commission and that sort of thing, that is set for tomorrow afternoon at 2:00 o'clock. So I am not free for any case tomorrow afternoon.

I am afraid the most you will have tomorrow would be a half day. I am having my clerk call the attorneys in that other case now, and if they are ready for trial, which I expect them to be, you won't even have a half day tomorrow.

I am sorry. My week has been somewhat disrupted, and I haven't known really until this morning just what the schedule might be.

So I will know more by the end of the day just what the situation is.

MR. ANDERSON: All right, your Honor. I would request, that if possible, we adopt Mr. Goldenberg's suggestion and merely put whatever Mr. Fritsche might say as an offer of proof on that point because he is not under my control and he has been cooperative. I have,

I think, taken advantage of his good nature a little bit over the last few months.

If it is possible to do it tomorrow, I don't think he will take more than a few hours.

THE COURT: I was going to say if you thought it was going to be a very short time, I could hear him tomorrow; but if it was going to be a few hours --

MR. ANDERSON: I guess I would have to, in all fairness, say I expect an hour, so it is probably going to take two.

THE COURT: We probably won't be able to do it tomorrow, but as I say, I will let you know later today what the situation is.

Are you ready to call your first witness?

MR. ANDERSON: Yes, sir.

(There was a brief interruption,
after which the following further
proceedings were had herein:)

THE COURT: All right, Mr. Anderson, will you call your first witness?

MR. ANDERSON: Plaintiffs call Mr. Ralph Baer.

(Witness duly sworn.)

RALPH H. BAER,
called as a witness herein for and in behalf of the plaintiffs, having been first duly sworn, was examined and testified as follows:

DIRECT EXAMINATION

BY MR. ANDERSON:

Q Mr. Baer, will you please state your full name for the record?

A Ralph Henry Baer.

Q Where do you reside?

A In Manchester, New Hampshire.

Q By whom are you employed?

A Sanders Associates, Inc., Nashua, New Hampshire.

Q For how long have you been employed by Sanders Associates?

A Something in excess of eighteen years.

Q What is your present title or assignment at Sanders Associates?

A I am a member of the technical staff, and I work in the corporate research and development office.

Q I gather that you joined Sanders Associates in about 1958 then, if you have been with them eighteen years?

A That is correct, in August, to be precise.

Q Will you briefly trace your employment and responsibility at Sanders over the period from 1958 to date? What were your first duties?

A I joined Sanders as a senior electronics engineer, and shortly thereafter became a manager of the Electronics Design Department.

Within a year or so of that assignment I became division manager of the Equipment Design Division.

Through the next ten years or so I remained division manager of a division of some 250, 300, 400, sometimes 500 professional people, engineers, scientists, technicians, other support people.

We were primarily concerned with development of electronic subsystems and systems.

Q What period of time were you division manager of the Equipment Design Division?

A Around roughly 1960 to '70.

Q After 1970 what were your duties at Sanders Associates?

A I moved into Flexprint Division of Sanders Associates and became division manager of that division

for about a year, year and a quarter.

Q After that what were your duties?

A Shortly thereafter I moved into the Electro-Optics Division and became chief engineer of that division for some two or three years.

Q Can you briefly describe your duties and the type of work the Equipment Design Division did in this period from 1960 to 1970?

A Certainly.

As division manager I had both administrative as well as technical responsibility for the execution of all the programs within the division. We did a great deal of basic electronics development work, systems development work, and of course with as large a number of personnel that I had to contend with, there was associated paper work and personnel work, which kept me busy, although I had always an administrative staff. So I was able to stay close to the technical end of the business.

Q What type of products were you involved with during this period from 1960 to 1971, when you were manager of the Electronics Design Division?

A Sanders basically is a defense electronics firm. Some of the equipment with which I had contact and with which we worked in the division was related to military programs, defense programs. For example, we

have large numbers of electronic counter-measures systems, which are developed at Sanders, produced at Sanders, both for the Navy, Air Force and other divisions of the Armed Forces.

We participated in those, largely in support of other divisions in the company, which in turn specialize in these various areas. For example, areas like ocean systems, which include some marine warfare. For example, the detection of underwater vehicles and Sonobuoys are a typical example of products which we developed, for which Sanders has a considerable reputation.

Q Can you state your formal education after high school?

A Certainly. After high school, I became an electronics technician, although we didn't call it that in those days. Before World War II the word electronics hadn't been coined.

I serviced radios in the very first of the television receivers in the days of the New York World's Fair in 1939.

I worked with FM sets, built public address equipment, and then was inducted in the Army. I served for three years.

After the Army, I went back to school under the GI Bill of Rights and graduated right here in Chicago from the American Television Institute of Technology in '49, with a degree in TV Engineering, a B.S. in TV engineering.

Q From 1949 until you joined Sanders Associates in 1958, can you briefly trace your employment history?

A Certainly. After coming out of school in Chicago, I joined a small company, Wappler, Incorporated in New York, where I was the chief and only engineer. We were engaged in the development and manufacture of electro-medical equipment, such as muscle toning equipment and diathermy machinery.

Q For how long were you with Wappler, Inc.?

A Approximately a year, year and a half.

Q Where did you go after that for employment?

A To Loral Electronics, again in New York.

Loral is a company very much like Sanders, styled about the same time, pretty much the same business. There I was initially engaged in military electronics development work, but then switched over into the development of what was to be a very high quality television receiver. I had responsibility for about two-thirds of that receiver.

Q For how long were you with Loral Electronics?

A A year and a half, two years.

Q Does that take you to about 1951 or '2?

A It should take me to '52, I think.

Q What did you do then after that professionally?

A The chief engineer of Loral left and started a company called Transitron in downtown New York. I joined him and became internal chief engineer of the new company, engaged in very much the same thing we had done at Loral. We built test equipment for the Army, for the Navy for several years.

Q After Transitron, did you go to Sanders or was there another intermediate --

A No, there was no intermediate employment.

Q What was that, please?

A There is no intermediate employment.

MR. ANDERSON: Your Honor, I don't know if you would like formal offers in evidence.

THE COURT: Let's just consider everything will be received unless it is refused, and you can assume it will be received unless there is an objection and I rule on it. We can save time that way.

So you can just start referring to exhibit numbers.

MR. GOLDENBERG: Would it be satisfactory, your Honor, if at the time of first reference, if there is going to be an objection, if it were made then?

THE COURT: Yes, I think that is right. Then at the end of the case or from time to time, I will just simply indicate that all exhibits are in evidence.

MR. GOLDENBERG: The problem in one part is that included on the plaintiffs' exhibit list are a number of exhibits pertaining to this Atari Pong matter.

THE COURT: I see. No, I am not receiving everything now. As it is discussed, unless there is some objection or some indication to the contrary from me, it will be considered received in evidence.

MR. GOLDENBERG: Thank you.

THE COURT: It won't be necessary to offer it or even to identify it unless it is necessary to do that in connection with the testimony of the witness.

MR. ANDERSON: A very fine procedure. Thank you, your Honor.

BY MR. ANDERSON:

Q Mr. Baer, in Plaintiffs' Exhibit 1, and specifically Exhibit 1-C, Patent No. 3,659,285, and 1-D, Patent Reissue RE 28,598, the inventors include Ralph H. Baer. Is that you?

A Yes, sir.

Q Those patents relate to television games, is that correct?

A Yes, they do.

Q Can you state how you first had any involvement or interest in television games?

A Throughout 1966 the thought of employing television receivers, which even then were big in the United States, to say nothing of the rest of the world, occurred to me. Television receivers are a very powerful display and really a very complex piece of equipment. Virtually everyone owns one. In fact, then there was some 62 million TV homes, and quite a few more, in the United States alone. This is TV homes, not TV sets.

The thought of appending a commercial product to this very broad base is a very powerful stimulant for creative thinking because even if you could get a small percentage of those sets involved in a new product, it clearly brings up visions of large dollar returns, and that is a powerful stimulant.

So sometime in August, while I was sitting around waiting for an associate to come into New York by air -- I was sitting specifically in the East Side airline terminal waiting for him to come in on some business trip -- I began to organize my thoughts on how to employ a TV set.

I decided that playing games might be a very good application. It is really as basic as that.

During the ensuing days I thought about the problem somewhat and began to formulate the basis for some of the physical work that would have to be done, and then finally put down in documentary form some of these thoughts.

We began a small program at Sanders to take advantage of these thoughts.

Q Do you know the date when you had this first thought at the East Side airline terminal?

A No, it was sometime in August. The only date which I am aware of is the date of the first written document, which is early in September.

Q I would like to hand you Plaintiffs' Exhibit 64-2 and ask you, if you can, to identify that.

May I approach the bench?

THE COURT: Yes.

BY THE WITNESS:

A Yes, I certainly can identify that. That is the document to which I just had reference, which is dated 1 September '66 on the cover page.

BY MR. ANDERSON:

Q Who prepared the document, Exhibit 64-2?

A I did, sir.

Q When did you prepare the document?

A Following 1 September '66. I believe you will find the pages are dated.

THE COURT: This is not marked, is it?

MR. ANDERSON: I am sorry, we did not mark the copy.

THE COURT: That is all right, I can mark it myself. I thought if it was, I wouldn't have to.

That is all right.

MR. ANDERSON: I might say that 9-2 was a deposition exhibit, at the lower right-hand corner of the copy. That is true of most of our exhibits.

We have renumbered them because there was some overlapping. The suffixes will normally be on the documents. The prefixes will be different.

THE COURT: All right, we are going to have a different marking system for the trial than you had for your deposition?

MR. ANDERSON: Yes, the 64-2 exhibit number is

the trial deposition number, listed in that manner in our list of exhibits.

THE COURT: All right.

MR. ANDERSON: That will be true of all of our exhibits. We will not use the deposition numbers during the trial.

I think the deposition numbers will apply with respect to certain exhibits that accompany the depositions that we will put in as a unit.

MR. GOLDENBERG: Mr. Anderson, excuse me. How do I relate the 64-2 to the 64 on the exhibit list?

MR. ANDERSON: As it was in the deposition. If you can't find it, I will be happy to hand you a copy.

It was 9-2 of the deposition.

MR. GOLDENBERG: I see what you mean, sir.

MR. ANDERSON: Would you like a copy? You are welcome to it.

MR. GOLDENBERG: May I hold off for a minute? We should have it here. Let us make sure.

(There was a brief interruption,
after which the following proceedings
were had herein:)

MR. GOLDENBERG: We do have that. Thank you.

BY MR. ANDERSON:

Q Mr. Baer, at the time that you prepared Exhibit 64-2, on about September 1, 1966, did you discuss it or show it to anyone else?

A Yes, I did. I showed it to Mr. Robert Solomon and asked him to sign the pages.

Q Who is Mr. Robert Solomon?

A Mr. Solomon is an electronics engineer who has been employed by Sanders, specifically in my division.

Q Did he sign the pages as you asked him to?

A Yes, he did.

Q Which pages did he sign, Mr. Baer?

A He signed the page designated page 1. He signed page 2 of 4. He signed page 3 of 4 and page 4 of 4.

All the pages containing handwritten materials are countersigned by Mr. Solomon.

MR. GOLDENBERG: Mr. Anderson, I apologize for interrupting, but just so we be sure we understand really what you are talking about, would pages 2 through 6 be 64-2 through 64-6? Is that it?

MR. ANDERSON: Yes, I think that is the better way of describing it.

THE WITNESS: That is correct.

MR. ANDERSON: I think we did put a separate

sticker on each of the originals, 64-2 through 64-6.

Thank you.

MR. GOLDENBERG: Thank you. I apologize for the interruption.

BY MR. ANDERSON:

Q Mr. Baer, then, Mr. Solomon signed pages 64-3, -4, -5 and -6, is that correct?

A That is correct, sir.

Q This is in your handwriting, is that correct?

A Yes, I am afraid so.

Q I am afraid it is not too easy to read.

Could you describe for us what you set down in here, perhaps summarizing each paragraph first and perhaps then going through and providing any specifics that are contained in the individual paragraphs?

A All right, sir. The first page begins with a caption. It says that the material deals with background material on conceptual TV gaming displays.

The first paragraph deals with the intent of the proposed effort. The second paragraph deals with some classes of games considered at the time, which then breaks down into a series of sub-headings from A through H, including such things as action games, board skill games, artistic games, instructional games, board chance games,

card games, game monitoring sports games, such as auto racing, et cetera.

It then goes on, on the third page, to show some of the intent of how I planned to carry this work forward, particularly addressing itself to the proprietary nature of the work and that I intended to safeguard the work so it wouldn't be exposed to too many people in the open laboratories at Sanders Associates.

Then there follows another list of conceptual ideas and techniques, which have to do with color generation, for example, and the use of color in TV games and some specific references to specific games, on through the fourth page.

Q Referring to page 64-3, and specifically to the paragraph labeled "Intent", will you describe what you have set forth there?

A Perhaps the best thing to do is to read it. It is quite short.

It says here:

"The purpose of the invention is to provide a large variety of low cost data entry devices which can be used by an operator to communicate with a monochrome or color TV set, a standard, commercial, unmodified type. Entry into the TV set is to be gained either through

"direct connection to the video system at the second detector or by connection to the antenna terminals, substituting the entry device, hereinafter called generator, for the broadcast TV signal by modulating an RF oscillator, operating on one of several standard TV channel frequencies and tuning the TV set to that channel, channel LP for 'Let's Play'."

The intent is pretty obvious from what I said. Do you want me to elaborate any further, Mr. Anderson?

Q Yes, can you describe the two alternatives that you set forth there, either through direct connection to the video system or to the antenna terminals?

A There are two ways, which I describe here, which can be used to enter the video signal, like Mr. Anderson tried to describe to you this morning on his chart.

One is a common way in which a broadcast television receiver works, through the antenna terminals, because those are the only two connections on the TV set that are normally available to the home user. There simply aren't any others, unlike in years gone by where a jack was provided so you could plug in your phonograph in effect. Manufacturers have not seen fit to put a jack in the back of a TV set so you could enter the television

picture half way into the TV set and ignore all those parts of the TV set which are simply required to translate the RF transmission, or Channel 2, 3, 4 or 7 or 13, amplify it, and eventually recover the signal which this transmission carries.

The transmission medium plays no part in the generation of a transmission and the creation of a TV signal, except to act as a carrier. If you could somehow stick a video signal through a paper tube and shoot it through a pneumatic tube, it would provide the same purpose.

Q Mr. Baer, I think you are talking a little fast for the reporter.

A I am sorry, it is my nature. That's the problem.

Q Let me --

A Can I get to the second manner in which you can enter a TV set?

Q Yes.

A The alternate way, if the video signal which is created by a camera or, in our case, a TV game, is available in an electrical form on a pair of wires, it does not have to be placed on a carrier and needs to be radiated through the air and picked out by an antenna, since that is the only connection between a receiver and a transmitting station or studio remotely situated.

If that is not the case, then you can bypass a substantial portion of what we call a front half or front end of a television receiver and go right into that portion of a television receiver which will handle both the synchronization signals Mr. Anderson talked about this morning and the video signals.

That is what I had reference to when I talked about getting into the video system at the second detector. Anyone who is familiar with broadcast receivers or television receivers knows that that is the division line

at which the so-called radio frequency or RF front end stops and where the video section or, in the case of the radio receiver, the sound section begins.

I think that is adequate.

Q You mentioned that the RF signal was merely a vehicle, I think you said, and was not an essential part of the TV signal.

What are the essential parts of a TV signal?

A Well, they are three. They need to be at a minimum vertical or horizontal synchronization pulses -- that is two elements -- and the video signal itself, which conveys the brightness picture information.

Q Now, in paragraph 1 under "Intent", you recite these two accesses, direct connection or the antenna terminals, and after that you have a phrase, "Thus substituting". The rest of that sentence after "thus substituting" is what? What does the rest of that sentence refer to? Either or both of the two connection techniques.

A It is intended to indicate what we must do here in the device which I propose is to create a signal as a format that is consistent with standard television broadcast practice, so that we can substitute that box for broadcast transmission, because that is how the TV receiver is intended to receive.

Q Does that relate to the direct connection to the second detector or to the antenna terminal connection, or both?

A Really both. I don't make the distinction.

Q Would you then go on and describe the classes of games which you considered in 1966, in the section marked "2"?

A All right. Under (a) I describe action games which involve the skill of the operator, and manual dexterity. For example, it says here, as an example: steering a wheel to control a random drift of a color or hue over the CRT face, with a timer possibly timing the participant to the extent that he can maintain a particular color on screen.

Can I make a remark prior to going on here as to what was the thinking behind all of this? I think it is sort of basic to understand what I was looking for at the time was a very low-cost device, because it was inconceivable to me that one could sell something for a large sum of money. It would have to be proportionately much smaller than the size of a TV set.

So the first classification of games we will be talking about really are very elementary and basic and directed toward this cost consideration.

Q At this time did you have a specific price in mind, Mr. Baer?

A I always talked about the \$19.95, or in my bad moments, about the \$29.95 TV game. In today's dollars, I guess we are just about there.

Q Are there any games listed in your set of games that relate to manipulating the display on the screen and, if so, will you identify which ones?

A Yes. The first one talked about involving the skill of the operator, that is, controlling, a display in this case, the change of a color or hue of the display.

Under (H), for example, the last of the items on page 4, I talked about sports games, such as auto racing, using the screen as a roadway or obstacle course, or for target shooting, using the screen as a target, both of which, of course, require the participation of the viewer-player participant.

Q I notice on the title of page 64-3 you have "TV Gaming Display" with "TVG" and "D" underlined and emphasized.

Was there any significance in that marking?

A The only significance is that we used the initials "TVG" and sometimes "TVGD" to represent television gaming or television gaming display for conven-

ience.

Q Can you describe what you have set forth in the balance of the document, including pages 64-5 and 64-6?

A Yes, sir. On 64-5 I suggest that this work be officially financed, funded, through appropriate corporate channels at Sanders, and that all such work be done in an area that can be safeguarded so that no uncontrolled traffic can pass by.

In the second half of 64-5 I list a series of conceptual ideas and techniques which occurred to me at the time and make the observation that I intend to supplement that list in the future as other ideas come along.

Toward the bottom, under 3.1, I describe specifically the method of producing colors and controlling those colors through manual intervention of a viewer by turning a knob.

Q I notice reference in that paragraph, Paragraph 3.1 to a 3.58MC. What is that?

A Megacycle.

Q Is that a particular frequency in the television spectrum?

A Yes, it is. It is the so-called chroma frequency. It is a signal transmitted on every broadcast which carries color information, which is necessary to

the generation and the decoding and the proper reproducing of colors in a color TV set. That signal is ignored in a black and white set.

Q Under the next paragraph, 3.2, I see reference to two players operating a pump. Can you describe what you were setting forth there?

A Yes. In this case I visualized two participants, two players, which would pump, in this case switches, in such a way as to cause a resultant color change or possibly horizon bar -- I believe this was a color change -- on the screen. The game content was who could arrive at some color or maintain a color for the longest time.

THE COURT: May I ask a question? Does the element of color enter either of the patent claims, or does it find its way into any of the games that are presently on the market?

MR. ANDERSON: Your Honor, I think color will not be an issue in this lawsuit.

THE COURT: The reason I am asking is I will not concentrate on it if it is not important. I am trying to sort out what is important.

MR. ANDERSON: I think we probably can agree that color will not be important, but the games do have color capabilities and the patents do disclose various color techniques.

I do not think they will be in issue.

MR. GOLDENBERG: Your Honor --

THE COURT: I would ask counsel, as I am sure they know already, to keep the technical part of the case as simple as possible, in your own best interests. Don't tell me anything I don't need to know by way of technical information. It is going to be difficult enough for me to acquire the mastery of this that I am going to need to decide the case without having anything that is unnecessary.

MR. ANDERSON: Thank you, your Honor.

THE COURT: I don't mean to be critical, but I am nonetheless serious when I make that suggestion.

MR. ANDERSON: I think color may come up from time to time, and we will keep it to a minimum.

THE COURT: I will assume everything is important, then, and I will leave it to you gentlemen to monitor the material.

All right.

BY MR. ANDERSON:

Q Mr. Baer, you have described the pumping game of 3.2.

Will you refer to the remaining paragraphs of page 64-6 and describe in general what is set forth in those?

A In my subheading 3.3 on 64-6 I describe "bar, line or dot generation," which is the first time the concept of what has come to be known as a dot or spot or symbol on the screen appears in my notes. I talk about selectively blanking and blinking it.

Then I talk about somewhat more complicated subjects in the following paragraphs, such as use of electrical noise to produce random motions on the screen.

I talk about scan conversion techniques, which are one way of entering, controlling, the events in the playing of a TV game, and I talk about so-called free-running raster techniques, again employing noise, primarily to present a menu of varied techniques which were food for thought, for future development, intended to lead toward a variety of displays on the TV screen that would be very inexpensive, some of which became implemented and some of which did not become implemented later.

Q Mr. Baer, at the time you wrote Exhibit 64-2 through 64-6, what if any other TV GD or TV gaming displays

were you aware of?

A I was aware of none, Mr. Anderson.

Q After writing your memo of September 1st and 2nd, 1966, what did you do next with respect to TV gaming?

A Well, to begin with, I believe I made some other notes, and I think within a day or so of the date I wrote these pages, I generated a block diagram, a rudimentary schematic that showed an elementary TV game in which two participants could move two independent player spots on the screen of a TV set. I also began to do some experimental work on the bench, mostly after hours, on my own.

Q I will hand you Plaintiffs' Exhibit 66-4A, and ask if you can identify that document.

A What is the number?

Q 64-4A; I am sorry, 66-4A.

A 66-4A; is the schematic or block diagram to which I just alluded. It shows the elements of the two-spot television game.

Q Did you personally prepare Exhibit 66-4A?

A Yes, I did.

Q On what date?

A On the 6th of September, 1966.

Q Did you show this document to others?

A Yes, to Mr. Solomon, who signed this document also in the lower left-hand corner on the same day.

Q You say this relates to some type of two-player display?

A Yes, it does.

Q Can you describe just in general what is shown in the block diagram, Exhibit 66-4A?

A Yes. In general what is shown is a schematic indication of the provision for vertical sync, horizontal sync, and a generation of two spots, their summation into a single video signal, and the eventual summation of that single video signal and the two sync signals into a composite video and sync signal.

Q Are these the three basic elements of a TV signal that you described earlier?

A Yes.

Q With respect to the specific blocks, can you show where the vertical sync, the horizontal sync and the video information come from, and just generally how they are combined and where they come out and what happens to them after that?

A If you look at the upper right-hand corner of the page, there is a block labeled "Vertical sync generator".

Q That is "s-y-n-c"?

A "S-y-n-c".

Just below it is another block labeled "Horizontal sync generator".

You will notice that the outputs to the right of those blocks have two arrow switches to squiggly lines, denoting resistors, joined together, indicating that the horizontal and vertical sync signals generated by those two blocks are combined at that point.

A third squiggly line is connected to that same line. It has an arrow adjacent to it labeled "video".

Q That is immediately to the right of the two arrows you said combined horizontal and vertical?

A That's right. That is the point at which the video information is added to or summed in with the synchronization signals.

Then, if you will look at the page again, all three signals jointly enter a block called "RF OSC", which stands for oscillator, "Channel 2-5", which is simply the equivalent of a transmitter.

From that block emanates another arrow which goes to the antenna of a TV set -- "Ant." means antenna.

Q All of that is in the upper half of the exhibit, Exhibit 66-4A?

A That's right.

Baer - direct

Q Can you briefly describe what is depicted in your September 6 sketch, Exhibit 66-4A, in the lower half?

A The lower half contains four blocks vertically related to each other. The top two relate to the vertical and horizontal generation of rectangular spots on a TV set and show means for moving those spots in both a horizontal and vertical direction, and just below that there are two additional, identical blocks, which perform the same function for the ultimate unit participant player in the game.

Q So those four blocks combined are intended to show the generation of two spots, is that correct?

A That's correct.

Q The top two make one and the bottom two make one?

A That's right.

Q You say there is control of the location of this spot shown in that diagram?

A Yes. I think you can find them most easily if you look at the dashed lines that are all over this page and trace them back to the resistor symbol with the arrow through it which denotes a variable resistor control, which you can associate in your mind with a volume control or brightness control on a TV set, a control which has a knob on it, which you handle with your hands.

Q I notice at the upper portion of Exhibit 66-4A a drawing that looks a bit like a picket fence. Can you describe what you depicted there?

A That is a so-called waveform schematic. It depicts the waveform which represents both the horizontal and vertical synchronization pulses and the video pulses.

If you look at this figure, you notice that the horizontal pulses go in the upward direction on the page and the video pulses go downward. That again is a standard composite video and sync practice in the United States.

Q That is standard television format in the United States?

A Yes, sir.

Q Is it possible for you, Mr. Baer, having heard my opening presentation, to relate what is shown in the upper part of 66-4A to the colors which appear on Plaintiffs' Exhibit 79?

A Yes, certainly. If you start on the left hand of this waveform diagram and notice the first upward narrow rectangular pulse, that is a horizontal sync pulse which Mr. Anderson on his display denoted by a narrow red bar. Following that, that horizontal sync pulse, there is a pulse of similar shape, but going in the other direction on the piece of paper, and it is

called the negative direction, which denotes a video pulse.

If you look at the space between the first two upright pulses, the pulses pointing up, the horizontal sync pulses, that denotes the length of time. It is really time we are looking at, from one to the other, the time between two red marks on Mr. Anderson's chart. It is the time taken by a TV set to scan from the left-hand side on the screen to the right-hand side, which in standard practice turns out to be something like some 65 millionths of a second.

About half way during that time period, looking again at my sketch, at the top of the page of this exhibit, you see a negative-going video pulse, a pulse going in the opposite direction. That means at that time during the period of time during which that pulse existed, which is denoted by its width, that the screen was lit up, if you will, or produced a white line of a certain width. Its location is determined by just how far that negative-going pulse is from the prior horizontal sync pulse.

So if in your mind you slide that negative-going video pulse back and forth on the paper between the two bracketing horizontal sync pulses, you mentally are now moving the spot, or at least a line on the screen,

back and forth on the screen, and if you relate that to the schematic below, that is the purpose of the scrolls.

Q I think you mentioned that the three downwardly directed rectangles, pulses, marked "Video" would be white on the screen?

A That's right.

Q Is there a level or a line on that particular curve of 66-4A that would demonstrate black or approximately black?

A Well, it is convention that in U.S. transmission of television signals, that synchronization pulses are what we call blacker than black. They are always starting from black and going blacker than black. That means they are simply not visible on the screen. So anything above the central line which is denoted by the dotted lines to the left of that schematic or horizontal four-dashed lines, three or four-dashed lines, to the left of the waveform can be considered as a level between black and darkest gray, for example, with increasing brightness of pure white, if you will, at the bottom of those negative-going video waveforms.

Q As of the date of Exhibit 66-4A, September 6, 1966, had you done any bench work or physical work toward building anything of this type?

A No, I had not.

Q Can you then describe what you did next
with respect to TV gaming after September 6th?

THE COURT: May I ask a question about the diagram?

THE WITNESS: Certainly.

THE COURT: Is there anything about the video pulses there, the ones that go in a downward direction, that indicates their color intensity?

THE WITNESS: No, sir, there is no color involved in these schematics you are looking at here. It simply denotes that they are either white or grey.

THE COURT: O.K.

BY MR. ANDERSON:

Q I guess as long as we are still on Exhibit 66-4A, Mr. Baer, I might ask you what is depicted on the far right side of that exhibit, just for completeness.

A The far right side denotes a mechanical arrangement of four control knobs. You will find them labeled H and V for Horizontal and Vertical control, which allows two participants to manipulate two spots, the particular configuration being inspired by the Etch-A-Sketch game, which is referenced just above the picture, and which one also manipulates a horizontal and vertical knob to move in this case a stylus.

Q Then will you state what you did subsequent to September 6, 1966, if anything, with respect to TV games?

A Well, I began to do some bench work. Actually,

since this started as sort of a fun project, I did the work myself in the late afternoon hours. I attempted to get Mr. Solomon involved at first, but was not very successful. I began to build an elementary breadboard, which was intended to produce a spot on the screen, which I could control or manipulate through manual controls, and I did do that sometime during the period of September-October-November of 1966.

Q Did you make a diagram of the circuit which you did this work on?

A Yes. There were a number of diagrams generated during that time.

Q I will hand you Plaintiffs' Exhibit 64-10A, and ask you if you can identify that.

A Mr. Anderson, that is a schematic of the hardware built during that period of time.

Q Is this hardware that you personally built?

A Yes, it is.

Q Was the hardware operated in any way?

A Yes, it was.

Q Can you just briefly describe then how the hardware was operated, and if possible relate it to Exhibit 64-10A?

A Certainly.

The hardware simply shows a method for

generating a spot on the TV screen in both the elements of a horizontal spot generator, which has the characteristic of adjustable delay, with respect to horizontal sync, as well as a vertical spot generator having the same characteristics in the vertical direction as are shown on the schematic.

The end result was a piece of equipment which showed a simple rectangular spot on the TV screen which could be manipulated by turning the two controls that are shown sort of pictorially as knobs near the bottom center of the page here, connected with dotted lines or dashed lines to the control, the variable resistor symbol.

Q Can you just generally state what is shown in the tables at the top of Exhibit 64-10A?

A Yes. Those reference both the frequencies of the various signals in the circuits involved, the width in terms of microseconds or milliseconds of other various pulses, the delays which were achievable by the circuit, and the delay being identical or synonymous with shifting of the display on the screen horizontally and vertically, and other technical data such as the amplitude of the wave form 6, and that sort of thing.

Q I think you mentioned, and I notice that the horizontal sync signal comes in at the point marked "H",

approximately at the center of Exhibit 64-10A, and the vertical sync signal comes in below that at the point marked "V" on Exhibit 64-10A.

Were those signals generated within this equipment that you built, or did you obtain them from some other source?

A No, I had handy -- at hand in the lab -- a piece of test equipment. So instead of building the circuitry up, I simply extracted horizontal and vertical sync signals from that set.

Q Do you know whether or not the piece of equipment that you did this work on still exists?

A It existed until several years ago, but I think someone took it home and lined his TV set up with it.

Q What happened next in your work on TV gaming?

A Well, I think there was a hiatus of several weeks, during which official funding was procured from the corporate research and development office, because it became obvious to me that this was not an after-hours job, that it was something that deserved more attention and a technician was brought on board, and he essentially completed the breadboard I started sometime in January.

Q What was that technician's name?

A I believe his name was Robert Tromblay,
T-r-o-m-b-l-a-y.

Q Does the breadboard which he built up still exist?

A Yes, it does.

THE COURT: When you talk about a bread board, do you mean literally?

THE WITNESS: No. That is the euphemism, your Honor, for rudimentary assembly of the electronic parts. It started on real bread boards back in the 1920s, but since then it has become a term you apply to all rough laboratory-type assemblies, generally of an experimental nature.

THE COURT: Did the device that is shown on 64-10A include a television screen?

THE WITNESS: Yes. What is not obvious from this schematic is that the output from the generator, which I used in conjunction with the spot generators, did get applied to in fact the color television set which we purchased for the purpose at the time and which still exists today, a large RCA color television set. Actually, the display of a spot was observed and manipulated on the screen at the time.

BY MR. ANDERSON:

Q Where did the signal that was applied to the RCA color TV come out of the circuit diagram of Exhibit 64-10A, if you can state?

A Well, if you look at the very right-hand side, you will see two vacuum tube symbols indicated as V

for vacuum tube, "9B" and "V9A", and those are constituent parts of the same piece of test equipment from which I extracted the horizontal and vertical sync signal for convenience sake.

That same piece of test equipment combined the horizontal and vertical portions inside of it to make a composite radio and sync signal, and then placed it on a carrier, another reason for using the instrument, placed it on a three or four carrier to make it simply to apply the output to a standard TV set.

Q In addition to the circuit which you built up in 64-10A in about December of 1966, you utilized this piece of test equipment that generated the vertical sync and horizontal sync, and you used the test equipment to combine the video, the vertical sync and the horizontal sync, and then applied that to the RCA color television set?

A That is correct.

Q Were you able to operate that combination that you have just identified?

A Yes, sir.

Q What result was produced, if you recall, in response?

A I believe I already said that. We had a spot, distinct, rectangular spot, on the screen, which was

movable by turning the controls indicated on the schematic.

Q To what degree was it movable?

A Anywhere on the screen. If you look at the numbers in the tabulation at the top of the page for horizontal and vertical delay, you will find that those are more than adequate to move the spot over the entire raster horizontally as well as vertically.

Q The delay that you said is sufficient to move the spot from left to right and from top to bottom, where is that in Exhibit 64-10A?

A If you look at the subheading (2)(d), "Delay", you will see under the column labeled, "Horizontal" the entry 10 to 50 microseconds.

If you move to the right of that, you will see under "Vertical" 25 to 13,000 microseconds.

If you relate that to standard U.S. television practice, you will recognize those delays as being adequate to move clear across the screen both laterally as well as vertically.

Q Perhaps to give that more meaning is it possible to say approximately what a 10 microsecond horizontal delay, as listed under (2)(d) "HORIZ" would produce on a screen?

A Yes. The distance between two horizontal sync pulses in terms of time is 65 microseconds, and some of

that time is consumed in flying back to the left-hand side and basically in overscanning a TV set so that the edge of the TV picture doesn't show, is hidden behind the mask, which means we lose sometimes the total usable time during which you see something on your TV sets -- it is on the order of 50 odd microseconds.

So if you have, say, a set which has a 12 inch horizontal dimension, or make it a 10 inch dimension, if the total length of time it takes to go from here to there is 50 microseconds, then each inch is 50 divided by 10, or 5 microseconds in length. It takes 5 microseconds for a spot to move one inch on your screen.

If you look back at my tabulation, it says here a delay of 10 microseconds is a minimum achieved, with a maximum of 50. That means that sometime from horizontal sync to 10 microseconds later I was able to display something. That 10 microseconds was consumed in fly back, which means that the spot was shown at the left-hand side of the screen when the control was so adjusted as to produce a 10 microsecond delay, and 50 microseconds later we are 50 times -- let's see. 10 inches? A microsecond per inch? 50 microseconds later we are 10 inches further down, which means we were able to move the spot clear across the screen to the right-hand side.

That is the significance of the numbers.

Q I see.

In a general way can you relate to the delay listed under "Vertical" at the top right side of Exhibit 64-10A, where the numbers are 2500 to 13000 microseconds?

A To make it real brief, the total vertical interval from top to bottom is about 16,000 microseconds or 16 milliseconds. If you take 15 per cent or 20 per cent of that, you are somewhere near the top of the picture, and the number 2500 clearly falls within 20 per cent of 16,000, and with 13,000 we are somewhere within 20 per cent of the maximum, so you can go from about 20 per cent, starting at the very top, going from about 20 per cent from vertical sync down to within 20 per cent of the next picture, and that part of the picture is normally hidden behind the mask anyhow. Besides, there is nothing magic about these limitations.

Q I would like to hand you physical exhibit Plaintiffs' Exhibit 55 and ask you if you can state what that is?

A That is a breadboard. It is the breadboard which Technician Tromblay, who we referred to earlier, finished up for me. I think it was in January 1967.

Q Now, on Exhibit 64-10A, as I understand it, it shows two vacuum tubes, is that correct?

A That is correct, sir.

Q And there are four tube sockets on Exhibit 55.
Can you explain that?

A Yes. I think we have another schematic somewhere in our collection that shows what these are. I happen to remember what they are. Two of these sockets were used for two tubes, as shown in the schematic. The other two were used for a different purpose. One I believe was used as an amplifier to amplify the output of the signals generated by these two tubes. The third one has to do with color generation.

Q When was the breadboard, Exhibit 55, completed, approximately?

A Sometime in January of 1967.

Q Was that breadboard operated?

A Yes, it was. It was operated on that same color RCA TV set I referred to earlier.

Q After January of 1967 what occurred in the TV gaming work that you were doing next?

A Well, there was a brief hiatus while funding was made available, and as a result of that I was able to bring two people into the picture, one of whom was Bill Harrison or William Harrison, who was then a technician, and later on associate engineer or engineering associate, and Bill Rush, who was attached to the IR&D office at the

time and was made available for engineer work sometime in March or April of that year.

Q When did Mr. Rush become available for you for work on TV gaming?

A Sometime in March or April.

Q When did Mr. Harrison become available to you?

A I believe he began work about May 1st of 1967.

Q What is the next event that occurred that you recollect at this time in the TV gaming program after the January work?

A Well, if you bear in mind that the object was to create a commercially viable product, we did two things: we got together and discussed just what games might be played within the constraints of the low-cost device, which could be built into a reliable piece of equipment, and for that reason Rush and I sat down, and I imagine Harrison joined us at times, and we generated ideas on the subject of what games we ought to address ourselves to and looked ahead toward what kinds of circuitry might be involved.

Q Were any records made of the early conversations?

A Yes. I believe I asked Bill Rush to summarize some of these sessions and also to inject whatever other novel ideas he might have on his own, and hand me a memo covering the subject.

Q I hand you Plaintiffs' Exhibit 64-44 and ask you if that relates to your testimony?

MR. ANDERSON: Your Honor, I am sorry, but we don't have copies of this one. We will provide them after lunch.

BY THE WITNESS:

A Yes, sir. That is the final typed copy -- this is a Xerox of it, of course -- of a memo which I asked Rush to prepare.

BY MR. ANDERSON:

Q Can you go through the memo, Exhibit 64-44 and describe what is contained in that memo?

A Yes, sir. The memo contains a number of sub-headings concerning with different concepts for playing TV games.

Shall I read the headings?

Q Yes. First I might ask who actually prepared that particular document, Exhibit 64-44?

A My recollection is that I asked Mr. Rush to hand me a rough draft, which I then corrected, and if you look at the file reference at the top of the first page, you will see the initials "RB" so my secretary typed up the corrected rough draft that Rush handed me, and the pictures on the first page and second page I entered. That is my handwriting, if you call it hand-

writing.

So basically the final memo, as you see it here, was released through my office.

MR. ANDERSON: Your Honor, the copies I have handed you is actually from another file and is not 64-44 but an identical copy of it.

THE COURT: Are the exhibits that I am being handed going to be the original exhibits for the record, or do you have another set?

MR. ANDERSON: Except for the first one, I handed the witness what I thought would be the original with the label on it. Since then I have tried to reverse the practice.

THE COURT: It is probably better if I have copies in case I want to make notes on them, if you can do that.

MR. ANDERSON: Sure.

THE COURT: For instance, this looks like an original, as does my copy of 64-10A. That looks like the original.

MR. ANDERSON: It is. Perhaps I can give you the copies --

THE COURT: I am not going to make any notes on this. Why don't you give me the copy, and then you can have the original exhibits remain with the

court reporters.

As a matter of fact, why don't we recess
now, and come back at about a quarter to 2:00.

(Whereupon the trial of the above-
entitled cause was recessed to 1:45
p.m. of the same day and date.)

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